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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,693

01/03/2006

Hiroaki Koyama

CSP-115-A

8753

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7590

02/11/2009

CARRIER BLACKMAN AND ASSOCIATES

24101 NOVI ROAD

SUITE 100

NOVI, MI 48375

EXAMINER

LIN, KUANG Y

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

02/11/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/532,693	Applicant(s) KOYAMA ET AL.	
	Examiner Kuang Y. Lin	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6, 10, 14 and 16-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6, 10, 14 and 16-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1793

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 6, 10, 17-19 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-060,845 and further in view of JP 10-204,610.

JP '845 shows a method for prolonging service life of the casting die by maintaining the compressive residual stress of a die cavity surface for more than 1000 MPa (see [0003] and [0028]) through a shot-peening and a nitriding process. Thus, JP ,845 substantially shows the invention as claimed except it does not use the nitrosulphurizing process for coating the die surface and does not disclose the surface roughness. However, JP '610 shows to use the nitrosulphurizing process to form a coating layer on the die surface to prevent seizure in a die by forming a dense coating layer having a lubricating effect and a

Art Unit: 1793

thermal insulating effect and to improve the service life of the die by forming a nitrided layer containing iron sulfide on the die cavity surface. It would have been obvious to further include the iron sulfide of JP '610 in the nitrided layer of JP '845 by using the nitrosuphurizing process of JP '610 in view of the advantage. With respect to the roughness of the cavity die surface, in [0015] of JP '845 it discloses to perform shot peening before and after the nitriding treatment. Also, in [0025] it further discloses to use carborundum with a diameter of 50-100 micrometers and a injection pressure of 0.3 MPa for peening treatment of the die surface before the nitriding treatment and use glass beads with a diameter of 1-50 micrometers and a injection pressure of 0.4 MPa for peening treatment of die surface after the nitriding treatment. The process parameters of the peening process of JP '845 is similar to that of instant process. Thus, it is expected that the surface roughness of JP '845 will be the same as that of instant application. With respect to claim 19, it would have been obvious to obtain the optimal temperature range in the process chamber through routine experimentation. With respect to claims 23 and 25 , it is conventional to use chrome molybdenum steel for making casting die as acknowledged by applicant as set forth in [007] of the instant specification. With respect to claim 24, JP '610 shows the claimed range (see [0015] and [0022]).

4. Claims 14, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-060,845 in view of JP 10-204,610 as applied to claim 1 above, and further in view of US 6,546,968 to Nakagawa et al.

Art Unit: 1793

Nakagawa et al. discloses that the atmosphere during nitriding treatment, instead of nitrogen gas, can be a nitrogen compound gas such as ammonia gas or the like or hydrogen gas. When the ammonia gas is used, the rate of nitriding reaction can be increased. At this time, by using together such gases as hydrogen, nitrogen, argon or the like, the rate of nitriding reaction can be controlled. Thus, it would have been obvious to further provide the hydrogen gas and ammonia gas of Nakagawa et al. in the nitriding process of JP '845 or nitrosuphurizing process of JP '610 such that to better control the nitriding or nitrosuphurizing reaction.

5. Applicant's arguments filed Jan. 28, 2009 have been fully considered but they are not persuasive.

a. Applicant in page 12, 1st para. of the response stated that the surface roughness and residual stress of JP '845 is different from that of instant application. However, it is noted that it is conventional to use different material, such as SKD61 and SCM material, for making casting die as admitted by applicant (see [002] and [007]). JP '845 shows to use SKD61 as die material (see [0023]). It is expected that residual stress would be much higher if SCM material, which is stronger than SKD61, were used. Also, when comparing the process parameters in [0025] of JP '845 and that of [0047] and [0052] of the instant specification, those parameters (diameter of the particle, injection pressure, injection time) are about in the same range. It is expected that when SCM material were used in the process of JP '845 the residual stress as well as

Art Unit: 1793

surface roughness in the casting die of JP '845 would be in the same range as that of instant application.

- b. Applicant in page 12, 2nd para. of the response stated that Examiner's interpretation of peening treating time of JP '845 is incorrect. Applicant further stated in page 13, 1st and 2nd para. of the response stated that the instant inventor used a small, manually-operable shot peening nozzle for treating different portions of the large casting die in sequential operation, i.e. the balls are shot from the nozzle toward one part of the casting die for the predetermined time of 5-10 seconds, then balls are shot from the nozzle toward another portion of the casting die for 5-10 seconds, and this is repeated until all portions of the casting die have been uniformly treated for 5-10 seconds. However, **there is no support in the specification for the alleged *procedure of shot peening treatment using a small, manually-operable shot peening nozzle for treating large casting die.*** The specification simply recites that the ceramic particles make the collision for 5-10 seconds per 5 cm² (see [0047] and [0052]). Thus, without any evidence showing otherwise, applicant's argument is not deemed to be persuasive and the rejection based on the prior art reference's teaching stated supra is deemed to be proper. Further, if the procedure and the duration of peening were so critical to the instant invention, then there would be a question of adequacy of the disclosure in the specification.
- c. Applicant in page 16, 2nd para. of the response stated that the claimed surface roughness is not a matter of optimization. However, it is a well

Art Unit: 1793

recognized fact that the roughness of the die surface affects the smoothness of the cast surface. The roughness also affects the cooling rate of the molten metal in the die cavity since as the die surface becoming smoother the more contact area between the molten metal and the die surface it became and thereby enhance the heat transfer process. Thus, it would have been obvious to obtain the die surface of JP '845 as smooth as possible to optimize the casting result.

d. Applicant in page 17, last para. of the response stated that there is no evidence to support for the Examiner's allegation regarding selecting different material and process parameters to obtain the claimed residual stress in the process of JP '845. However, it is noted that applicant admitted that it is conventional to use different material, such as SKD61 and SCM material, for making die (see [002] and [007]). SCM material is stronger than SKD61. JP '845 uses SKD61 (see [0023]) as die material. It would have been obvious to obtain a higher residual stress when SCM material in JP '845.

e. Applicant in page 18, 2nd para. of the response stated that JP '845 includes a single shot peening step for treatment of used casting die. However, it would have been obvious to those of ordinary skill in the art that two peening step would obtain a higher residual stress. Thus, it would have been obvious to include another peening treatment after the nitriding treatment should a higher residual stress is needed.

Art Unit: 1793

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuang Y. Lin whose telephone number is 571-272-1179. The examiner can normally be reached on Monday-Friday, 10:00-6:30,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kuang Y. Lin/
Primary Examiner, Art Unit 1793

2-5-09